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N-63-3-1

TM-1003/006/00

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TECHNICAL MEMORANDUM

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Milestone 11

Flexowriter Paper Tape to Core Corrector Routine (SFLXLOD)

By

R. C. Wise

7 March 1963

Approved

J. B. Munson

SYSTEM DEVELOPMENT CORPORATION
2500 COLORADO AVE.
SANTA MONICA
CALIFORNIA

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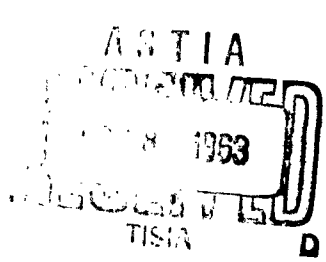


IDENTIFICATION

A. Title: Flexowriter Paper Tape to Core Corrector Routine (SFLXLOD)
Ident 16C, Mod AA

B. Author: R. C. Wise, System Development Corporation,
15 February 1963

PURPOSE

SFLXLOD is a 160A program which will accept a special format paper tape and make corrections to core. The program exists on a bi-octal tape and will operate independent of its position in memory.

USAGE

A. Operation

SFLXLOD is loaded from a bi-octal tape into any bank of the 160A. The program may be loaded into any location (provided of course, there is sufficient room for it to operate - 162_8 cells). To initiate the program, load the input tape in the reader, set the P-Register to the starting location of SFLXLOD and run. After loading all corrections from the input tape the program will halt.

B. Program Halts

1. SFLXLOD + 52_8 - Illegal bank number (b>3).
2. SFLXLOD + 76_8 - Space code (04) encountered where not expected.
3. SFLXLOD +102_8 - Stop code (34) encountered.
4. SFLXLOD +162_8 - Non-Octal character in a corrector field.

All halts are non-recoverable.

C. Input Format

The input to SFLXLOD is a paper tape containing corrections to core. The tape may be produced by a flexowriter, or the program STWEP.

The format of the tape is as follows:

CR	Carriage Return (45_8)
SPACE	Space (04)
Bank number	Bank number (0-3)
Loading Address	First address (0000-7777)
SPACE	Space (04)
Correction 1	4 octal digits
SPACE	Space (04)
Correction 2	4 octal digits
SPACE	Space (04)
.	.
.	.
.	.
Correction N	
CR	
SPACE	
Bank number	
Loading address	
etc.	

METHOD

The input paper tape is read one character at a time and the characters are examined. If the character is a carriage return, a character is skipped and the next character is converted as the loading bank and the following four characters as the octal loading address. The next character is skipped and the succeeding four characters are converted as an octal number and deposited into memory in the bank specified and beginning at the address specified. The loading address is increased by one after each deposit. This

process continues until another carriage return is encountered in which case the process is restarted or until a space or stop code terminates the process. A 77 code is ignored and another character processed.

RESTRICTIONS

A. Only banks 0, 1, 2, 3 may be set.

B. Cell 7777 may be set only as the first loading address, not in a sequence.

C. The tape must have only Flex coded octal numbers for bank number, loading address, and corrections.

1. Legal Digits are as follows:

Number	Coded Number
0	56
1	74
2	70
3	64
4	62
5	66
6	72
7	60

D. The paper tape reader must be on the normal channel.

TIMING

The timing of the program is dependent upon the speed of the paper tape reader.

STORAGE

SFLXLOD occupies 162_8 cells. The program will operate in any position in the 160A.

TRANSFER FUNCTION

Area	Operation
DEPI	Set up to restore indirect setting after deposit.
START	Read paper tape until non-zero frame. Go to INCON+1.
ASET1	Set indirect to loading bank. Pick up value and store into loading address.
ASET3	Restore indirect bank setting. Increase loading address by one.
INCON	Read one frame of paper tape.
INCON+1	If character is carriage return, set switch to convert address and bank number. Otherwise go to CONV. If character was CR, space one frame and get the following character. If character is not zero, go to IC2.
IC1	Set up a "set indirect bank" instruction with the specified loading bank number and go to CONV.
IC2	Convert character if it is 1, 2 or 3 and go to IC1. Otherwise do an ERR halt.
ASETI	Get converted number and set up as loading address. Go back to INCON.
INCON3	Save converted number as if it were a correction. If switch set to convert address, go to ASETI. Otherwise go to ASET1.

Area	Operation
CONV	Initialize to convert 4 characters.
CONVA	Read one frame. If 77, go to CONVA. If 04, Halt. If 34, Halt. Otherwise go to AA.
NUM	Save converted number. If this is the fourth character, go to CONC. Accumulate with previous numbers and go to CONVA.
CONC	Get final digit, go to INCON3.
AA	Convert character if 0 thru 7 and go to NUM. Otherwise do ERR halt.

VALIDATION TEST

Several input tapes were read by the program and then the contents of the specified addresses were examined.

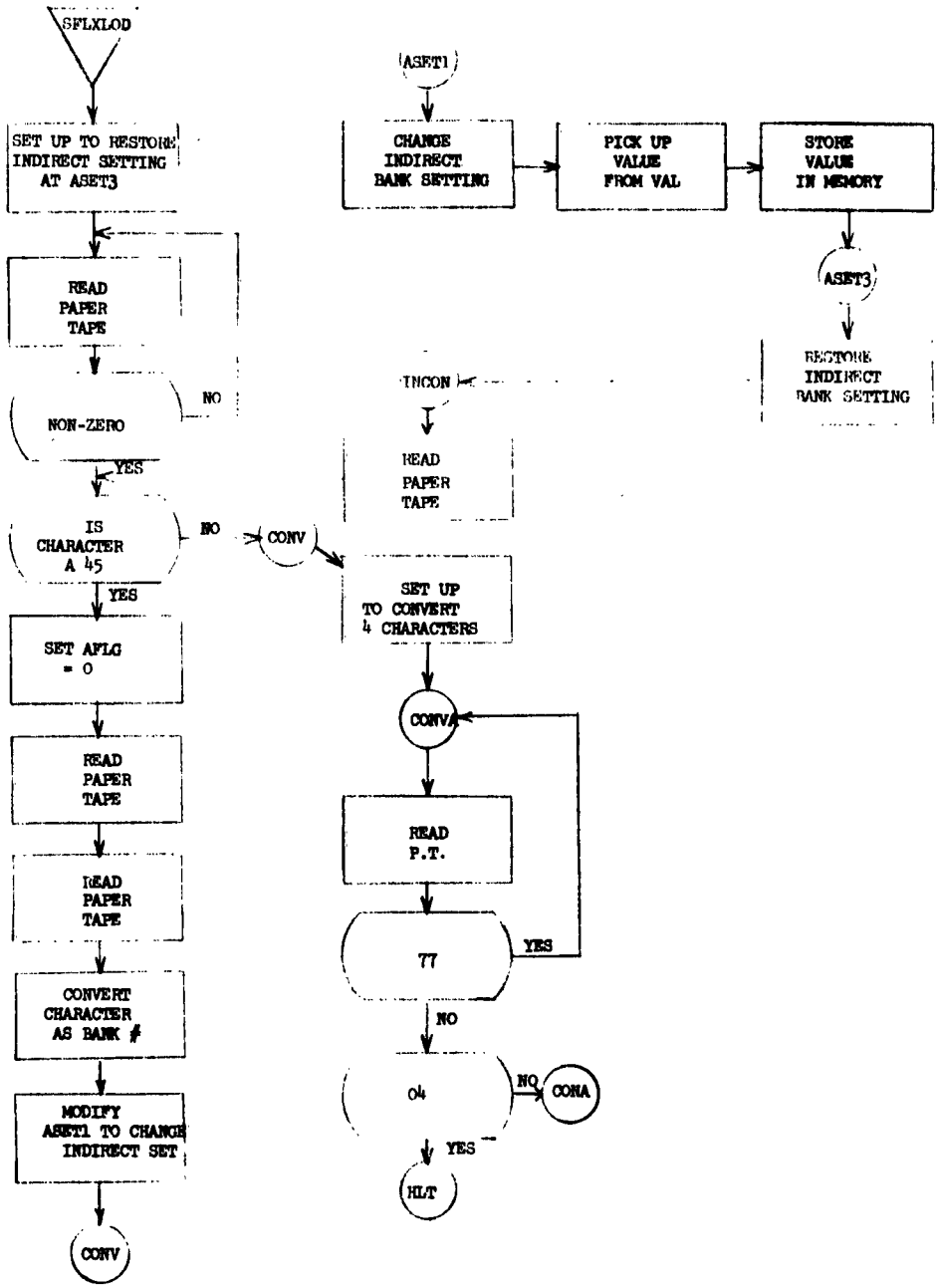
Representative tapes are shown below:

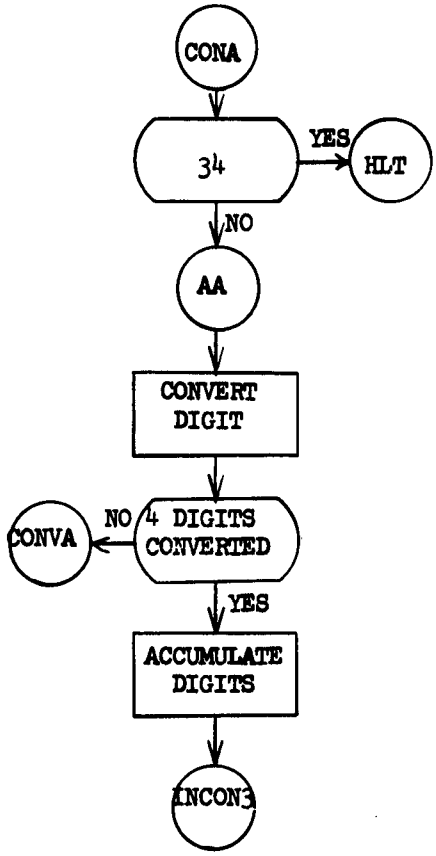
Tape 1.	30001	1111	2222	3333	4444	5555
	30006	6666	7777	0000	7700	0077
Tape 2.	10000	1111	2222	3333		
	20000	4444	5555	6666		
	30001	7777	0003	3335		
	00002	2223	5555	6666	5555	
		3322	1122	3344	5566	7711
Tape 3.	17776	1234				
	27657	1234	5670	1221		
	33566	7700	0077			

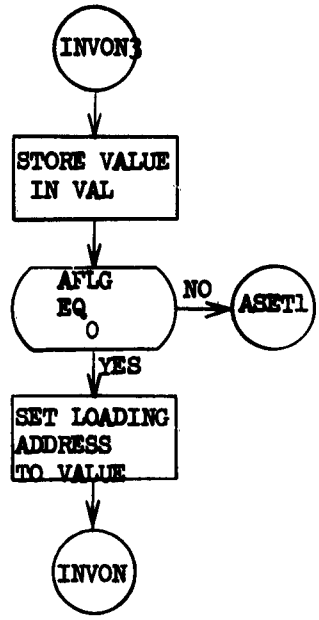
REFERENCES

TM-1003/007/00, Milestone 11, Typewriter to Typ-Coded Paper Tape Routine (STWEP), System Development Corporation, 7 March 1963.

FLOW DIAGRAM




CONA
34
YES
HLT
NO
AA
CONVERT DIGIT
4 DIGITS CONVERTED
NO
CONVA
YES
ACCUMULATE DIGITS
INCON3


INVON3
STORE VALUE IN VAL
AFLG EQ 0
NO
ASET1
YES
SET LOADING ADDRESS TO VALUE
INVON

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System Development Corporation,
Santa Monica, California
MILESTONE 11 - FLEXOWRITER PAPER
TAPE TO CORE CORRECTOR ROUTINE (SFLXLOD)
Scientific rept., TM-1003/006/00, by
R. C. Wise. 7 March 1963, 8p.
(Contract AF 19(628)-1648, Space Systems
Division Program, for Space Systems
Division, AFSC)

Unclassified report

DESCRIPTORS: Programming (Computers).
Satellite Networks.

Describes the Flexowriter Paper Tape
to Core Corrector Routine (SFLXLOD).
States that SFLXLOD is a 160A program

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